REMARKS

Claims 26 and 37-40 have been cancelled. Claims 24 and 34 have been amended. Proposed claims 49-56 would be new. It is submitted that no new matter has been introduced by the new claims and/or amended claims. Support for the new claims and/or amended claims is found generally in the original claims, the International Preliminary Examination Report (IPER) at pages 19-22 of International Application PCT/EP99/07038 (i.e., International Publication Number WO 00/17270), and numerous places throughout the specification; examples of each are shown in the table below.

Claims	Support		
	Original Claims	Annex to IPER	Specification (e.g., ...)
24 (Currently Amended)	claim 1	Claim 1	Pg. 3, ln. 3-28
34 (Currently Amended)	claim 11	Claim 10	Pg. 7, ln. 1-9
49 (New)	claim 1	Claim 1	Pg. 3, ln. 3-28
50 (New)	claim 3	Claim 2	Pg. 8, ln. 19 through pg. 9, ln. 6
51 (New)	claim 14	Claim 15	Pg. 5, ln. 12-21; pg. 12, ln. 1-3
52 (New)	claim 15	Claim 16	Pg. 8, ln. 11-14
53 (New)	claim 20	Claim 21	Pg. 11, ln. 22 through pg. 12, ln. 3
54 (New)	claim 21	Claim 22	Pg. 11, ln. 4-11; pg. 10, ln. 1-4
55 (New)	claim 22	Claim 23	Pg. 11, ln. 4-11
56 (New)	claim 23	Claim 24	Pg. 10, ln. 1-4

Claim 24 has been split into two *independent* claims wherein in one (claim 24 (currently amended)) the dispersed starch complex particles are bound to the hydrophobic polymer matrix by reactive groups present in the starch complex capable of being fixed to the

hydrophobic polymer matrix, and in the other (claim 49 (new)), the starch complex particles are bound to the hydrophobic polymer matrix by coupling agent containing groups compatible with the hydrophobic polymer matrix and the starch complex, or the coupling agent and reactive groups present in the starch complex.

Entry of the amendment is respectfully solicited, as it will place the claims in condition for allowance or, if necessary, simplify and clarify the issues for appeal.

Before discussing the pending rejections in detail, it would be helpful to briefly review the claimed invention. Amended claim 24 and new claim 49 recite starch complexes dispersed in a polymer matrix characterized by a microdispersion of its particles, a specific second-derivative IR absorption band, and a solubility in water at 100°C of less than 20% (the poor water solubility excludes the presence of non-complexed starch which is soluble and of water-soluble starch complexes, which, if present, would impair the properties of the compositions because of absorption of water). The amylase present in the starch complex is wholly or largely in complexed form. (pg. 4, lns. 4-5 of the publicshed PCT application).

Claim Rejections - 35 U.S.C. § 103(a)

The Examiner has rejected claims 24-48 under 35 U.S.C. 103(a) as being unpatentable over Bastioli et al (WO 98/20073) in view of Corvasce et al (EP 0795581) and Bastioli et al (EP 0965615). Applicants respectfully traverse the rejections and submit that a proper *prima facie* case of obviousness has not been made out.

The criteria and Examiner's burden for making a prima facie case of obviousness in accordance with MPEP Section 706.02(j) are as follows (emphasis and numbers added):

> To establish a prima facie case of obviousness, three basic criteria must be met. (1) First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. (2)

> Second, there must be a reasonable expectation of success. (3) Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. . . .
>
> The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." . . .

The best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references, and that that such references can be combined only if there is some suggestion or incentive to do so. In re Sang-Su Lee, 61 U.S.P.Q.2d 1430 (CAFC 2002).

Bastioli '073 In View Of Corvasce And Bastioli '615

The Examiner incorporated the rejection from Paper No. 7 where the Examiner wrote that:

> [I]t would have been obvious from the teachings of Corvace, to use coupling agent/s in the composition of Bastioli ('073) in order to improve mechanical strength of the product made out of that compositon. It would have been obvious, from the teachings of Bastioli ('615) to use a complexed starch in lieu of starch in the composition of Bastioli ('073) since a complexed starch imparts better resistance to ageing.
> (Paper 7, page 4).

As stated in the response filed October 8, 2002, the Examiner appears to be reasoning that it would have been obvious to simultaneously substitute a starch complex for starch in Bastioli '073 and also to introduce a coupling agent that would bind said newly substituted starch complex to the polymer matrix, supposedly because one of skill in the art would seek to "improve mechanical strength" and "resistance to aging".

Applicants submitted and respectfully continue to submit that the Examiner has not made a proper *prima facie* case of obviousness because one of skill in the art would have had no motivation to combine the disclosures in the manner the Examiner proposes. The Examiner fails to appreciate that the interaction of the chemical moieties in the compositions of Corvasce, Bastioli '073, Bastioli '615, and the present invention are significantly different and that such differences are so great that one of skill in the art would not be motivated to modify Bastioli '073 with Corvasce and Bastioli '065 in a manner that would yield the present invention. As the Examiner readily admits, while Bastoli '073 does disclose biodegradable compositions of starch dispersed inside a matrix of the thermoplastic polymer that is incompatible with starch (e.g., an aliphatic polyester), it fails to disclose a starch complex and coupling agents. Instead, the Examiner relies on Corvasce to try and fill the missing combination of elements.

In response to these arguments, the Examiner stated that "applicants argu[ment] that there is no motivation to combine references ... because of [the] interaction of chemical moieties of these references" is not persuasive "since no supportive data ha[s] been presented by the applicants" (Final Action mailed January 31, 2003, p. 2). The Examiner further stated that applicants' "argument about Bastioli ('615) based on critical plasticizer concentration range is not persuasive because Bastioli ('615) is a secondary reference, relied upon only for its teaching of use of complexed starch."

None of the prior art references relied upon by the Examiner disclose or hint at a starch complex having the properties set forth in the claims. Bastioli '073 fails to disclose, as the Examiner readily admits, a starch complex. Bastioli ('615) discloses compositions comprising starch, a thermoplastic polymer incompatible with starch, and a plasticizer, in which starch forms the dispersed phase and the thermoplastic polymer the continuous phase. As a consequence of

the preparation conditions, a complex of starch and the incompatible polymer forms to a concentration that reaches a maximum when the quantity of the plasticizer is within a critical range (2-8 wt% for glycerin) and the specific energy of extrusion is higher than a certain value (0.15 Kwh./Kg). The presence of the starch-complex is revealed by FTIR spectra or X-ray diffraction spectra. The mechanical properties of the compositions remarkably increase when the concentration of the starch complex reaches a maximum. (Pg. 3, [0021]).

According to the Examiner "Bastioli ('615) is a secondary reference, relied upon only for its teaching of use of complexed starch." However, a prior art reference must be considered in its entirety. *See, e.g.*, W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983); MPEP § 2141.02. Moreover, even though the starch complex of Bastioli '615 presents the IR characteristic as set forth in the claims, no mention is made in Bastioli '615 of the size of the particles of the complex and whether i) the amylase of the complex is wholly or only in part in complex form and ii) the starch is wholly or only in part in form of a complex. It is noted that the amount of starch of the compositions may indifferently be 10 to 70% referred to the incompatible polymer of the matrix (which means that, if the starch is wholly in complex form, it would be by chance). In addition, the aliphatic polyesters are the only specifically mentioned as example of incompatible thermoplastic polymers; no other polymers are mentioned.

For the foregoing reasons, Bastioli '615 or Bastioli '073 in combination with Bastioli '615 are not relevant to amended claim 24 (and/or the related dependent claims). One skilled in the art would not arrive at the claimed compositions based on the lack of teaching or suggestion in the references regarding the nature and the morphology of the starch complex used in the compositions claimed in amended claim 24.

Corvasce discloses a rubber composition containing a starch/plasticizer composite, optionally having a coupling agent used in combination with a reinforcing agent such as carbon black and/or silica (Corvasce, Abstract). The coupling agent contains two moieties; one moiety to interact chemically or physiochemically with the reinforcing agent (e.g., with hydroxyl groups on the surface of silica (SiOH groups)) and the other moiety to react with one or more of the elastomers, particularly diene-based sulfur curable elastomers (Corvasce, p. 2, lines 53-55). In this manner the coupling agent acts as a connecting bridge between the reinforcing agent and the rubber and thereby enhances the reinforcement of rubber (Corvasce, p. 3, lines 3-5). Usually the moiety of the coupling agent that is reactive towards rubber is temperature sensitive and tends to combine with the rubber during the final and higher temperature sulfur vulcanization stage. Because this is subsequent to the rubber/silica/coupler mixing stage, the silene groups of the coupler have already combined with silica (p. 3, lines 7-10).

Based on such teachings, applicants respectfully maintain that Corvasce does not at all teach or suggest improving mechanical properties (e.g., reinforcement), as asserted by the Examiner, by adding to, or reacting with, a starch complex. This is so, because, as described above, both the reactive moieties in the coupling agents of Corvasce's rubber compositions are engaged in the reaction with the reinforcing agent and the rubber, not the starch. The presently claimed starch complex is completely different than the reinforcing agent and the rubber of Corvasce. For this reason alone, applicants again submit that a proper *prima facie* case has not been made and the rejection should be withdrawn.

Moreover, the citation of Bastioli '073 in view of Corvasce and Bastioli '615 against new claim 49 and the related dependent claims would be improper since the substitution of the starch complex of Bastioli '615 (admitting arguendo that said complex can be isolated

from the matrix and presents the characteristics of the starch complex of claim 49), will result in a composition completely different from the compositions of claim 49 wherein the polymer matrix dispersing the starch complex is totally different from the matrix of the aliphatic polyesters listed in a) and b) or formed of the polymers mentioned in c) to g) of Bastioli '073.

Furthermore, the introduction in the compositions of Bastioli '073 of the coupling agents disclosed in Corvasce will not produce the effect disclosed in Corvasce of coupling with one moiety the hydroxyl groups present and the surface of the starch-plasticizer composite and with the other moiety the rubber component because no hydroxyl groups substantially exist in the starch complex having the characteristics as set forth in new claim 49, supposedly substituted for starch in Bastioli '073 and also because the starch incompatible polymers of claim 49 are not present in the compositions of Bastioli '073.

Therefore, for the foregoing reasons, it is respectfully submitted that the Examiner's rejection of Bastioli '073 in view of Corvasce and Bastioli '615 is not relevant to new claim 49 and the related dependent claims.

CONCLUSION

In view of the foregoing, favorable action on the merits, including withdrawal of the rejections, and allowance of all the claims, is respectfully requested. If the Examiner has any questions regarding this paper, please contact one of the undersigned attorneys.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 2, 2003.

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